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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/492,373	01/27/2000	Yuzo Horikoshi	991444	9795

38834 7590 01/18/2005

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 01/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/492,373

Applicant(s)

HORIKOSHI ET AL.

Examiner

Callie E. Shosho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,6-10,14-17 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,6-10,14-17 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/4/04 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 4, 6-10, 14-17, and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

(a) Claims 1, 14, 16, and 17 each recite that the copolymer has "glass transition point less than or equal to 50 °C" while newly added claim 20 recites that the copolymer has "glass transition point -30 through 50 °C. It is the examiner's position that these phrases fail to satisfy the written description requirement under the cited statute since there does not appear to be a

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written description requirement for the upper limit of the glass transition temperature of 50 °C in the application as originally filed, *In re Wright*, 866 F.2d 422, 9 USPQ2d 1649 (Fed. Cir. 1989) and MPEP 2163. Applicant has not pointed to any portion of the specification, and examiner has not found any support for this phraseology in the specification as originally filed.

Applicant has not pointed to, nor has examiner found, any support in the present specification for claiming the upper limit of the glass transition temperature as 50 °C. While there is support in the specification on page 7, lines 23-24 of the glass transition temperature of “at or below 70 °C” and from “-30 through 70 °C” and Table 1 discloses copolymer with glass transition temperatures both above and below 50 °C, there is no support for the recitation of 50 °C as the upper limit of the glass transition temperature in the above cited phrases.

(b) Claims 1, 14, 17, and 20 each recite “1 wt% or more of polymeric monomer including a polar group”. It is the examiner’s position that this change fails to satisfy the written description requirement under 35 USC 112, first paragraph since there does not appear to be a written description requirement for this phrase in the application as originally filed, *In re Wright*, 866 F.2d 422, 9 USPQ2d 1649 (Fed. Cir. 1989) and MPEP 2163.

It is noted that Table 1 on page 13 of the present specification discloses copolymers obtained from monomers, in addition to styrene and alkyl (meth) acrylate, such as (meth)acrylic acid, vinyl pyridine, 2-hydroxypropyl-N,N,N-trimethylammonium chloride acrylate, and N,N-diallylmethylammonium chloride, in amounts of 5%, 7%, and 10%. However, these few specific embodiments do not provide support for applicant to broadly recite that the polymeric monomer including polar group is present in amount of “1 wt% or more” given that the recitation of “1

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wt% or more” clearly encompasses any amount greater than or equal to 1% such as 20%, 50%, 80%, etc. for which there is clearly no support in the specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 4, 6-10, and 14-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 14, and 16-17 each recite that the monomers include “styrene derivatives”, “alkyl acrylate derivatives” and “alkyl methacrylate derivatives”. The scope of the claims is confusing because it is not clear what is meant by “derivatives”. What compounds are encompassed by this phrase?

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1, 4, 6-10, 14-17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al. (U.S. 6,248,805) in view of Patel et al. (U.S. 5,977,210) and Fujisawa et al. (U.S. 5,997,136).

Nguyen et al. disclose an ink jet ink comprising (i) 0.1-10% polymer which is obtained from 5-95% hydrophobic monomer such as alkyl (meth)acrylate, 5-95% hydrophobic monomer such as styrene, and 0-30% monomer which has a highly polar functional group including (meth)acrylic acid, (ii) solvent which is liquid at room temperature, and (iii) 0.5-10% colorant which is a dye or pigment wherein the colorant is dispersed in the polymer. The polymer has glass transition temperature of -25 to 110°C and is produced using emulsion polymerization. The ink is printed using an ink jet printer, which would intrinsically possess an ink cartridge to store the ink. It is also disclosed that in one embodiment, the polymer encapsulates the colorant so that the colorant clearly absorbs on or coats the surface of the polymer, however, it is further disclosed that there is no limit to the type of association between the colorant and the polymer. Further, given that all the ingredients are mixed together when forming the ink, is clear that the colorant is intrinsically dispersed in the solvent (col.4, lines 39-48 and 52-53 and 63-64, col.5, lines 18-20 and 25-34, and col.6, lines 8-20, 26-36, and 46-50, col.7, lines 34-55, col.10, line 48, col.13, lines 58-60, col.19, lines 54-61, col.22, lines 8-10, and col.26, line 66-col.27, line 15).

Although there is no explicit disclosure in Nguyen et al. that the surfactant covers a surface of the copolymer, given that the surfactant and copolymer are mixed together in Nguyen et al. (see examples), it would have been natural for one of ordinary skill in the art to infer that the surfactant intrinsically covers a surface of the copolymer.

The difference between Nguyen et al. and the present claimed invention is the requirement in the claims of (a) the volume average particle diameter of the polymer, (b) softening temperature of the polymer, and (c) piezo-type ink jet head.

With respect to difference (a), on the one hand, given that Nguyen et al. produces the polymer by emulsion polymerization as presently claimed, it would have been natural for one of ordinary skill in the art to infer that the polymer intrinsically possesses the same volume average particle diameter as presently claimed, and thus one of ordinary skill in the art would have arrived at the claimed invention.

On the other hand, Patel et al., which is drawn to ink jet inks, disclose the use of polymer having volume average particle size of 0.1-1 micron in order to produce an ink that will not clog the printer nozzles (col.3, lines 14-15 and col.4, lines 57-59).

In light of the motivation for using copolymer having specific volume average particle diameter disclosed by Patel et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use polymer with such volume average particle diameter in the ink of Nguyen et al. in order to produce an ink which will not clog the printer nozzles, and thereby arrive at the claimed invention.

With respect to difference (b), on the one hand, given that Nguyen et al. discloses copolymers identical to those presently claimed, i.e. obtained from the same types and amounts of monomers, it would have been natural for one of ordinary skill in the art to infer that the polymers intrinsically possess the same softening temperature as presently claimed, and thereby arrive at the claimed invention.

On the other hand, Fujisawa et al., which is drawn to ink jet inks, disclose that the softening temperature of polymers utilized in ink jet inks range from 50⁰ -120⁰ C wherein such temperature allows the ink to be heated quickly so that the ink dot is formed before penetration

of ink into recording medium occurs so that feathering of the ink on the recording medium is prevented (col.3, lines 13-35).

In light of the motivation for using polymer with specific softening temperature disclosed by Fujisawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use polymer with such softening temperature in the ink of Nguyen et al. in order to produce an ink which does not feather, and thereby arrive at the claimed invention.

With respect to difference (c), Nguyen et al. disclose the use of thermal ink jet printers (col.2, lines 46-52), however, there is no explicit disclosure of the use of printers containing piezo-type inkjet head as presently claimed.

Patel et al., which is drawn to ink jet ink, disclose the equivalence and interchangeability of thermal ink jet printer, as disclosed by Nguyen et al., with piezoelectric ink jet printer, as presently claimed, as devices used to cause droplets of ink to be ejected in an imagewise pattern on a substrate to generate images (col.7, lines 36-43).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use piezoelectric ink jet printer to print the ink of Nguyen et al., and thereby arrive at the claimed invention.

Response to Arguments regarding 35 USC 112 rejections

8. Applicants' arguments filed 11/4/04 have been fully considered but they are not persuasive.

With respect to the rejection given in paragraph 3a above, applicants argue that the subject matter of the claim need not be described literally in order for the disclosure to satisfy the

description requirement and cite In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). In Wertheim, the ranges described in the original specification included a range of 25-60% and specific examples of 36% and 50%. The courts held that a limitation to “between 35% and 60%” did meet the description requirement.

However, it is the examiner’s position that the present situation is not like that described in Wertheim. In the present specification, as noted by applicants, it is disclosed that the copolymer has the glass transition point of “at or below 70 °C” and “from –30 through 70 °C” and there are examples in Table 1, page 13 of copolymers with glass transition point of 45, 10, 40, 42, 65, 38, and 15 °C. Therefore, the value used in the range in Wertheim is much closer to the value disclosed in the example than in the present instance. That is, in Wertheim, the difference between the example and the claim is approximately 3%, i.e. percent difference between 35 and 36, while in the present application there is a difference between the example and the claim of about 11%, i.e. percent difference between 45 and 50.

With respect to the rejection given in paragraph 5 above, applicants argue that the term “derivatives” is commonly used in patent claims and states 22768 patents include this term in their claims. However, “it is immaterial whether similar claims have been allowed in another application”, In re Giolito et al., 188 USPQ 645. The examiner’s position remains that it is not clear what compounds are encompassed by this phrase. For instance, does derivatives of alkyl acrylate and alkyl methacrylate include hydroxyalkyl (meth)acrylates, aminoalkyl (meth)acrylates, etc?

Response to Arguments regarding 35 USC 103 rejection

9. Applicants' arguments filed 11/4/04 have been fully considered but they are not persuasive.

Specifically, applicants argue that none of the cited references disclose that copolymer is obtained from 1 or more wt% of polar monomer as required in the present claims.

However, it is noted that Nguyen et al. disclose an ink jet ink comprising (i) 0.1-10% polymer which has the structure $A_xB_yC'_z$ where A is a hydrophobic monomer such as alkyl (meth)acrylate, B is a hydrophobic monomer such as styrene, and C' is a monomer which has a highly polar functional group including (meth)acrylic acid, (ii) solvent which is liquid at room temperature, and (iii) colorant which is a dye or pigment wherein the colorant is dispersed in the polymer. The polymer has glass transition temperature of -25 to 110 °C and is produced using emulsion polymerization. The polymer is obtained from 5-95% monomer A, 5-95% monomer B, and 0-30% monomer C.

Attention is drawn to col.19, line 35 which discloses copolymer obtained from 40% styrene, 40% ethyl acrylate, and 20% acrylic acid. Such copolymer is obtained from type and amounts of monomers identical to those presently claimed. Further, it is calculated using glass transition temperatures of styrene, ethyl acrylate, and acrylic acid of 100 °C, -22 °C, and 106 °C, that the glass transition temperature of such copolymer is 40 °C which falls within the glass transition temperature presently claimed.

Applicants also argue that the inks disclosed in the cited references do not have the effect of rapid drying and therefore do not provide high quality image by stable dispersion due to rapid drying.

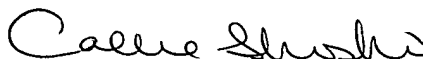
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Firstly, it is noted that there is no requirement in the claims regarding rapid drying. Secondly, even if such limitation were present in the claims, given that combination of cited references disclose ink comprising same types and amounts of ingredients as presently claimed, it is clear that such ink would inherently rapidly dry.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Callie E. Shosho
Primary Examiner
Art Unit 1714